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EXAMINER

ROE, JESSEE RANDALL

ART UNIT

PAPER NUMBER

1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/642,518	Applicant(s) BENEDICTUS ET AL.	
	Examiner Jessee Roe	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2008 and 29 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-34, 38-50, 52-54 and 56-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-34, 38-50, 52-54 and 56-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>25 August 2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 25 August 2008 has been entered.

Status of the Claims

Claims 23-34, 38-50, 52-54 and 56-61 are pending wherein claims 58-61 are new and claims 1-22, 35-37, 51 and 55 are canceled.

Claim Objections

Claims 45 and 60 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

In regards to claims 45 and 60, claim 23 recites "casting an ingot consisting of the following composition" and allows for at most 0.05% per element and up to 0.15% total of incidental elements and impurities. However, claim 45 recites "further comprises one or more of the elements Zn, Ag, Hf, V,

Art Unit: 1793

Sc, Ti, or Li, the total amount less than 1.00 (in weight %). Claim 45 fails to further limit claim 23 because claim 45 allows for a higher content of incidental elements than claim 23. Additionally, claim 60 allows for more scandium than is allowed by claim 23.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 45 and 60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claim 45, claim 23 recites “casting an ingot consisting of the following composition” and allows for at most 0.05% per element and up to 0.15% total of incidental elements and impurities. However, claim 45 recites “further comprises one or more of the elements Zn, Ag, Hf, V, Sc, Ti, or Li, the total amount less than 1.00 (in weight %). The combination of the “consisting of” transitional language and the “comprises” transitional language renders the scope of the claim indefinite and claim 45 fails to further limit claim 23 because claim 45 allows for a higher content of incidental elements than claim 23.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1793

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 23-24, 26-34, 38-50, 52-54, 56-59 and 61 are rejected

under 35 U.S.C. 103(a) as being unpatentable over Cassada III (US 5,593,516).

In regards to claims 23-24, 29, 50 and 54, Cassada III ('516) discloses a process for forming an aluminum alloy by ingot casting (DC casting, column 4, line 40), homogenizing, preheating, hot rolling with optional reheating as necessary, solution heat treating, quenching, stretching, artificially aging (column 7, lines 6-27). Although Cassada III ('516) teaches a peak strength T6-type temper, it would have been obvious to one of ordinary skill in the art to apply a T3 or T351 naturally aging temper in order to obtain moderate strength properties while eliminating the need for an artificial aging cycle. The Table below provides a comparison of the aluminum-base alloy disclosed by Cassada III ('516) with that of the aluminum-base alloy claimed in the instant invention.

Element	From Instant Claims (weight percent)	Cassada III ('516) (weight percent)	Overlap (weight percent)
Cu	4.3 – 4.9	2.5 – 5.5	4.3 – 4.9
Mg	1.5 – 1.8	0.1 – 2.3	1.5 – 1.8
Si	0.10 – 0.40	0 – 0.10	0.10
Cr	0 – 0.15	0	0
Fe	$0 < \text{Fe} \leq 0.10$	0 – 0.15	$0 < \text{Fe} \leq 0.10$
Al	Balance	Balance	Balance

The Examiner notes that the disclosed amounts of copper, magnesium, silicon, chromium, and iron for an aluminum-based alloy overlaps the claimed

Art Unit: 1793

amounts of copper, magnesium, silicon, chromium, and iron, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed amounts of copper, magnesium, silicon, chromium, and iron for an aluminum-based alloy from the amounts disclosed by Cassada III ('516) because Cassada III ('516) discloses the same utility throughout the disclosed ranges.

In regards to claims 26-28, Cassada III ('516) discloses a 1% stretching. With respect to the recitation "naturally aged for more than 10 days", the Examiner notes that this step would encompass no active heating step of the alloy for 10 days.

In regards to claim 30, Cassada III ('516) discloses forming an aluminum alloy sheet, typically 0.400 inches thick (10.16 mm) (col. 7, line 16).

In regards to claim 31, although Cassada III ('516) does not specify that aluminum alloy sheet would have a thickness in the range of 25 to 50 mm, mere scaling up of a prior art process capable of being scaled up would not establish patentability in a claim to an old process so scaled. MPEP 2144.04 IV (A).

In regards to claims 32-34, Cassada III ('516) discloses using the alloy for aircraft wing skins or body sheet (col. 8, lines 28-29).

In regards to claims 42-44, Cassada III ('516) discloses up to 0.25 weight percent silicon (col. 3, line 40).

With respect to the tensile strength, yield strength, fatigue crack growth rate limitations in claims 46-49, because Cassada III ('516) teaches an alloy with

Art Unit: 1793

the presently claimed alloying ranges processed substantially as claimed, substantially the same properties are expected to be present. MPEP 2112.01 I.

In regards to claims 52-53, Cassada III ('516) discloses up to 0.80 weight percent manganese (col. 3, lines 18-42), which would include 0 weight percent , in addition to up to 0.15 weight percent iron (claim 10).

In regards to claims 56, Cassada III ('516) discloses an aluminum based alloy having 2.5 to 5.5 weight percent copper; 0.10 to 2.3 weight percent magnesium; up to 0.80 weight percent manganese (which would include 0 weight percent); up to about 0.15 weight percent iron; and up to about 0.25 weight percent silicon, which overlaps the ranges of 4.3 to 4.5 weight percent copper; 0 weight percent manganese; 1.6 to 1.7 weight percent magnesium; 0.06 to 0.10 weight percent iron; and 0.23 to 0.30 weight percent silicon, as claimed in the instant invention.

In regards to claim 57, Cassada III ('516) discloses an aluminum based alloy having 2.5 to 5.5 weight percent copper; 0.10 to 2.3 weight percent magnesium; up to 0.80 weight percent manganese (which would include 0 weight percent); up to about 0.15 weight percent iron; and up to about 0.25 weight percent silicon, which overlaps the ranges of 4.3 to 4.5 weight percent copper; 0 weight percent manganese; 1.6 to 1.7 weight percent magnesium; 0.06 to 0.10 weight percent iron; and 0.10 to 0.25 weight percent silicon, as claimed in the instant invention.

In regards to claims 58, Cassada III ('516) discloses an aluminum based alloy having 2.5 to 5.5 weight percent copper; 0.10 to 2.3 weight percent

Art Unit: 1793

magnesium; up to 0.80 weight percent manganese (which would include 0 weight percent); up to about 0.30 weight percent iron; and up to about 0.25 weight percent silicon, which overlaps the ranges of 4.4 to 4.5 weight percent copper; 0 weight percent manganese; 1.6 to 1.7 weight percent magnesium; 0.06 to 0.10 weight percent iron; and 0.23 to 0.30 weight percent silicon, as claimed in the instant invention.

With respect to the tensile strength, yield strength, fatigue crack growth rate limitations in claim 58, because Cassada III ('516) teaches an alloy with the presently claimed alloying ranges processed substantially as claimed, substantially the same properties are expected to be present. MPEP 2112.01 I.

Still regarding claim 58, although Cassada III ('516) teaches a peak strength T6-type temper, it would have been obvious to one of ordinary skill in the art to apply a T3 or T351 naturally aging temper in order to obtain moderate strength properties while eliminating the need for an artificial aging cycle.

In regards to claim 59, Cassada III ('516) discloses an aluminum based alloy having 2.5 to 5.5 weight percent copper; 0.10 to 2.3 weight percent magnesium; up to 0.80 weight percent manganese (which would include 0 weight percent); up to about 0.15 weight percent iron; and up to about 0.25 weight percent silicon, which overlaps the ranges of 4.3 to 4.5 weight percent copper; 0 weight percent manganese; 1.6 to 1.7 weight percent magnesium; 0.06 to 0.10 weight percent iron; and 0.23 to 0.30 weight percent silicon, as claimed in the instant invention.

In regards to claim 61, Cassada III ('516) discloses 1.6 to 1.7 weight

Art Unit: 1793

percent magnesium and 2.5 to 5.5 weight percent copper, which overlap the ranges of 1.68 to 1.8 weight percent magnesium and 4.4 to 4.9 weight percent copper as instantly claimed.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cassada III (US 5,593,516) as applied to claim 23 above, and further in view of Rioja et al. (US 6,562,154).

In regards to claim 25, Cassada III ('516) discloses a process for forming an aluminum-copper alloy as described above, but Cassada III ('516) is silent with regard to the steps of cold rolling or inter-annealing.

Rioja ('154) discloses that cold rolling is effective for further reducing aluminum-copper alloys into thin sheets, wherein cold rolling can include intermediate anneals during the cold rolling (col. 6, lines 58-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process for forming the aluminum alloy as disclosed by Cassada III ('516), by further reducing by cold rolling and inter-annealing, as disclosed by Rioja ('154), in order to form thinner aluminum sheets, as disclosed by Rioja ('154) (col. 6, lines 58-60).

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cassada III (US 5,593,516) as applied to claim 23 above, and further in view of the Metals Handbook Desk Edition.

In regards to claim 31, Cassada III ('516) discloses a process for forming

Art Unit: 1793

an aluminum-copper alloy as described above, but Cassada III ('516) is silent with regard to rolling to form thick sheets.

However, the Metals Handbook Desk Edition teaches that similar 2024 type Al-Cu alloys can be formed into sheet 0.15 to 6.3 mm thick or 6.3 to 200 mm thick plate (pg. 445, 3rd column) depending on the application (pg. 446). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the alloy as taught by Cassada III ('516) into thick section, within the presently claimed 25 to 50 mm because the Metals Handbook Desk Edition teaches that substantially similar 2024 alloys are formed into thick plate used for aircraft structures where high strength is required, as disclosed by the Metals Handbook Desk Edition (pg. 445, 3rd column and pg. 446).

Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cassada III (US 5,593,516) as applied to claim 23 above, and further in view of Tack et al. (US 5,620,652).

In regards to claim 60, Cassada III ('516) discloses a process for forming an aluminum-copper alloy as described above, but Cassada III ('516) is silent with regard to adding scandium to the alloy.

Tack et al. ('652) discloses adding 0.02 to about 10 weight percent scandium to aluminum-base alloys used for aircraft structures in order to enhance properties and improve processing characteristics such as weld performance (abstract, col. 4, lines 34-40 and col. 5, lines 28-49).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add 0.02 to about 10 weight percent

scandium, as disclosed by Tack et al. ('652), to the aluminum-base alloys, as disclosed by Cassada III ('516), in order to enhance properties and improve processing characteristics such as weld performance, as disclosed by Tack et al. ('652) (abstract, col. 4, lines 34-40 and col. 5, lines 28-49).

Response to Arguments

Applicant's arguments filed 28 August 2008 have been fully considered but they are not persuasive.

First, the Applicant primarily argues that Cassada III ('516) repeatedly states that his solubility equations relating magnesium and copper levels are mandatory such that the solubility limit is not exceeded and that it is important to avoid any excess solute that would contribute to the second phase content and diminish its fracture toughness.

In response, the Examiner notes that Cassada III ('516) teaches that that the control of the copper and magnesium would be in order to avoid any excess solute that would contribute to the second phase content and diminish fracture toughness (cols. 3-4) and "*In one aspect of the invention*, the aluminum-based has the major solute elements of copper and magnesium controlled such that the solubility limit is not exceeded" (col. 3, lines 51-54). Therefore, the processing disclosed by Cassada III ('516) is not limited to the processing of compositions within the solubility limits and would allow for the processing of compositions outside of the solubility limits where excess solute and lower fracture toughness would be acceptable. Disclosed examples and preferred embodiments do not

Art Unit: 1793

constitute a teaching away from a broader disclosure or nonpreferred embodiments. MPEP 2123 II.

Second, the Applicant primarily argues that the Advisory Action appears to agree that Alloy 2 is closer to claim 56 than the closest exemplified alloy of Cassada III ('516); proof of unexpected advantages may be in the form of direct or indirect testing of the claimed invention and the prior art; an unexpected improvement in only one property is enough to establish patentability; Alloy 1 obtains an unexpected beneficial combination of properties when Alloys 1 and 2 are compared to AA2024 and AA2524.

In response, the Examiner notes that the silicon content of Alloy 2 is 0.11 weight percent silicon and the silicon content of Alloy 1 is 0.25 weight percent whereas the range of silicon for claim 23 is 0.10 to 0.40 weight percent silicon and the range of silicon for claim 56 is 0.23 to 0.30 weight percent silicon. To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range. MPEP 716.02(d)(II). With respect to claim 23, the Applicant has not provided the differences between the properties of an alloy having a substantially similar composition with 0.09 weight percent silicon and a composition having a substantially similar composition with 0.41 weight percent. With respect to claim 56, the Applicant has not provided the differences between the properties of an alloy having a substantially similar composition with 0.22 weight percent silicon; and a composition having a substantially similar composition with 0.31 weight percent. Therefore, the Applicant has not

Art Unit: 1793

sufficiently established unexpected results over the claimed range. MPEP

716.02(d)(II).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John P. Sheehan/
Primary Examiner, Art Unit 1793

JR